DOCUMENT RESUME

ED 375 809 IR 016 862

AUTHOR Benson, Gregory M., Jr.
TITLE The Lifelong Learning Society: Investing in the New Learning Technology Market Sector.
INSTITUTION Learning Systems Engineering, Stephentown, NY.
PUB DATE 94
NOTE 28p.
PUB TYPE Viewpoints (Opinion/Position Papers, Essays, etc.) (120)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Continuing Education; Distance Education; Educational Change; *Educational Technology; *Educational Trends; *Futures (of Society); *Investment; *Lifelong Learning; Technological Advancement; Trend Analysis
IDENTIFIERS *Market Research

ABSTRACT

Technological advancements can combine computer assisted instruction (CAI) and interactive, multimedia environments to create lifelong learning opportunities within reach of everyone in the world. Arguing that the emergence of technology-delivered education represents one of the most significant investment opportunities in recent history, this report provides information and analyses to inform investment and potential acquisition decisions in this new "learning technology sector." It begins by examining trends in five areas to provide a context for the learning environment: the economy, the society, the workplace, the emerging technology infrastructure, and the education and training system. A new paradigm for required knowledge and skills in the workplace is then introduced, followed by a review of features of the new education and training marketplace. These features include accumulated funding, cross-sector training, shared needs, "just-in-time" training, and self-paced mastery/learning. Five major developments in the technology and policy arenas that have contributed to this new market are listed, and their implications for market opportunities are examined. Critical success factors for services and companies are also identified, and conclusions and recommendations based on this study conclude the report. (JLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 375 809

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

The Lifelong Learning Society:

Investing in the New Learning Technology Market Sector

Learning Systems Engineering
Box 340, East Road
Stephentown, New York 12168
518.733.6324

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Gregory Benson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Table of Contents

Executive Summary 1

The Lifelong Learning Society:
Investing in the New Learning Technology Market Sector 2

I. Converging Trends as Context 3
- Economy 3
- Society 3
- Workplace 3
- The Emerging Technology Infrastructure:
  A Multi-Media Cloud 4
- The Education and Training System 7

II. A New Paradigm: the Life-Long Learning Society 11

III. Features of the New Education and Training Marketplace 13

IV. Infrastructure Capabilities for Entering the Marketplace 17

V. Implications for Market Opportunities 19

VI. Grasping Opportunities: Critical Success Factors 21
- Characteristics of Successful Services 21
- Characteristics of Successful Companies 22
- Case A 24
- Case B 25

Conclusions and Recommendations 27

Copyright © 1994 Learning Systems Engineering. All rights reserved. Not to be reproduced in any form, or electronically stored or transmitted, without prior written permission from Learning Systems Engineering, Box 340 East Road, Stephentown, New York 12168 518.733.6324.

Executive Summary

Education and training opportunities delivered to living rooms across the country via cable television and telephone services represent an exciting new perspective on what the lucrative "home improvement" market will soon be. Students needing supplementary assistance or seeking enrichment courses; parents seeking a GED, college courses, or training to improve job skills; and corporations desiring to upgrade employee competencies will all soon have these learning opportunities delivered to homes, the workplace, and community learning centers. New technical capacity will combine the power of computer assisted instruction and the motivational attraction of video and sound in an interactive, multimedia, electronic array of lifelong learning opportunities within reach of everyone in the world.

This emerging phenomenon represents one of the most significant investment opportunities in recent history. Like few other mass market services, technology-delivered education and training are not passing fancies. They are services that must be attuned to individual consumer needs and, thus, are eternally resistant to obsolescence. The ability to deliver high quality motivational education and training to homes will kindle an unprecedented international market expansion, incomparable growth of selected industry players, and substantial corporate profits in a heretofore uninteresting—indeed dull—investment sector. This document describes the emergence of the new learning technology sector. Prepared by Learning Systems Engineering, it is the initial step in a long-term effort to provide individual and institutional investors with information and analysis to inform investment and potential acquisition decisions in this new, high-growth arena.

Gregory M. Benson, Jr.
President
Learning Systems Engineering

The Lifelong Learning Society: Investing in the New Learning Technology Market Sector

Several trends and forces at work in the U. S. society, economy, and the workplace are converging to form a window of opportunity for exploiting emerging new markets for education and training while continuing to tap expanding traditional ones. The juxtaposition of these forces with the staggering scope and pace of the emerging technology infrastructure has substantial implications for education and training in both traditional and alternative settings. This alignment of developments presents a rare opportunity for investments in companies in or on the periphery of the education and training industry. These opportunities are not unlike those presented by the "biotechnology" marketplace several years ago.

This paper identifies market opportunities and investment possibilities emerging from these developments in a context we call the "learning technology sector." We provide an analysis of these trends as well as a description of the lifelong learning society that is in its embryonic stages. We then outline the major dimensions of this new educational marketplace and describe possible paths for its likely development. Based on these directions, we derive implications for new products and services and suggest characteristics of successful investments, products, and companies in this market. Taking early advantage of these investment opportunities will require putting aside traditional notions of education and training, and viewing the impediments and failures in the existing system as possibilities for new products and services.

Taking early advantage of these investment opportunities will require putting aside traditional notions of education and training, and viewing the impediments and failures in the existing system as possibilities for new products and services.

I. Converging Trends as Context

As we approach the new century, the world is changing at an unprecedented pace. The scope of these changes is unprecedented as well, resulting in whole new paradigms for society, the economy, and the workplace. New and emerging technologies, particularly those dealing with information and communication services, are contributing to, and in some cases precipitating, these changes which in turn challenge traditional conceptualizations of learning and learning environments. These challenges are spurring the restructuring of the existing education and training system while simultaneously stimulating the development of non-traditional alternatives to that system.

Economy

Economically, the United States is no longer the master of its own fate. The country's financial well-being is linked to interest rates in Germany, trade balances with Japan, and manufacturing productivity in South Korea and China. Most of our largest corporations create and sell a large portion of their products and services outside the United States and derive a substantial percentage of their income and profits from that commerce.

Society

Our society is undergoing similarly significant changes. The single parent family is increasingly prevalent, often led by a working mother. Facing a declining standard of living, many families send both father and mother off to work. Unemployment remains high even as some jobs remain unfilled because of a dearth of skilled candidates. The percentage of low-skill jobs is increasing.

Information and entertainment services comprise a growing proportion of at-home time, with the television on about seven hours a day. We are told—in Fortune, Time, and Scientific American—that electronic entertainment will be the dominant educational medium that will shape our global consciousness. It is likely that over the next five to ten years traditional broadcast and print media will merge into what one observer calls "a multi-media cloud that can float into the consumer's head" during those seven hours a day the television is switched on.

Workplace

Work and the workplace are being redefined as learning and work are merged. Information has become the principal product and service even in manufacturing and service companies. More work is being accomplished with fewer workers, a result of downsizing and work process re-engineering. White collar unemployment exceeds that for blue collar

workers for the first time in history. We are told that many existing jobs and a majority of new ones can be done in the home. The Electronic Industries Association reports that there are more than 40 million households with home offices.

Labor costs were up approximately 3.6 percent in January through June 1993, while the cost of capital equipment fell 7.7 percent. Since the mid-1980s the cost of labor has risen three times as fast as the cost of capital. Companies are intent on reducing labor costs and increasing the productivity of those workers remaining, principally through investments in technology and education and training. The quest for higher performance is seen as the key to survival in an increasingly competitive marketplace. Businesses are increasing the amount of education, training, and support provided to front-line workers as well as to white collar workers.

The Emerging Technology Infrastructure: A Multi-Media Cloud

"A technological shock wave is about to strike society and the workplace," says William M. Bluestein, a senior analyst with Forester Research, Inc., in Boston. "In the last six months computer hardware manufacturers, software providers, cable TV operators, and phone companies have been caught up in a frenzied mating dance." The Bell-Atlantic purchase of TCI is but an initial indication of what the future holds.

Information services are proliferating in a wide variety of formats, and their ease of use is improving to enable direct use by people in homes as an alternative to the television. The principal paths of the information superhighway advocated by Vice President Gore have been under construction for some time. These new digital technology highways will allow mail messages, digital video, or other forms of communication to be routed from any sender to any receiver within the network. The question of who will pay and how remains unanswered, but it is likely that the federal government will support and therefore influence future developments, particularly with respect to the telecommunications highway itself. Recently a pilot test of a national information network was announced by a number of private vendors including Hewlett Packard and Digital Equipment Corporation.

The largely federally supported Internet telecommunications network is an example of the unprecedented growth in this field. The system has grown to connect approximately sixteen thousand individual networks with about twenty million users in sixty countries. The recent rapid acceleration in its growth (approximately one million new members per month), spurred by exploding interest among educators, is likely to prompt substantial changes in the form and substance of the network over the next few years. The exploding growth of Internet provides evidence of the burgeoning market that crosses traditional segments in the education and

training market (i.e., K-12, higher education, home, business and industry).

The growing interest in Internet is all the more remarkable because it is not truly a user friendly system for the vast majority of teachers and students, and the information that it provides access to is largely unstructured, a major concern at all levels, both in the private and public sectors. Efforts to decrease complexity and increase ease of access, while adding programming and services better attuned to a larger education and training market, are likely to be well rewarded.

This growth in a federally sponsored telecommunications system is matched if not surpassed by events in the private sector. Several companies are merging to create one-stop information services within the home provided through a computer-television combination (soon to be a computer-television-telephone combination). The union of cable television and Internet provided by Continental Cable Vision and Jones Cable, is an example of how combinations among the various players in the media, entertainment, and information services business, linking with hardware and software vendors, will form new configurations of information services in a wide variety of formats that learners in any learning setting will be able to access. The investment opportunities rest with how these systems provide useful education and training resources to these learners and workers.

The cost of the technology tools—hardware and software—is dropping substantially; it is likely that very powerful devices for interacting with the emerging network will be available at prices very competitive with what a family invests in home entertainment. For our society, the cost of **not** employing technology-rich learning environments, in terms of unskilled workers and incompetent graduates, is rising faster than systemic application of these new capacities on a national scale.

For our society, the cost of* not *employing technology-rich learning environments, in terms of unskilled workers and incompetent graduates, is rising faster than systemic application of these new capacities on a national scale.

A wide range of technology capabilities and training products now exist which can be effectively integrated to support the new marketplace. Some examples include:

Telecommunications. These include wired and wireless networks for transmitting analog and digital data in voice, video, and text forms. These networks use landline and cellular communications as well as electronic mail, bulletin boards, and related information services. Such networks provide powerful supplements to traditional textbooks and related education and training materials. High school students can communicate with professors in universities as well as research and development personnel in business and industry to access current knowledge and learn about new research and development.

Distance Learning. Distance learning systems typically use communications technologies to link persons in one site to persons in other sites many miles away. The networks provide for some level of interaction between persons at these sites, typically in the form of two-way audio and/or data communications and one-way or two-way video transmission. The communications transmission media can include telephone lines, microwave transmission, cable transmission, satellite transmission, and fiber optic transmission, or some combination of these technologies.

Multimedia. Multimedia programs allow learners to use highly motivational materials that integrate text, graphics, sound, and motion for illustrating particular ideas or as teaching tools with an impact that rivals television. In schools, and soon via telecommunications to the home, traditional books can be replaced by multi-media presentations, thus reflecting the way knowledge is disseminated in real-world learning and work contexts.

Integrated Learning Systems. These comprehensive computer-based, multimedia instructional packages include instructional modules, support materials, assessment, and information management. Such systems can bring a wide range of instruction into a workplace, a home, or community center.

Graphics and Tools. Graphics are used in conjunction with spreadsheets and databases to create charts and graphs illustrating trends and properties of data, in preparing reports, research studies, and presentations. These tools include painting, drawing, and music programs, which allow the teacher and learner to give personal expression and produce artistic works.

CD-ROM. Compact Disc-Read Only Memory (CD-ROM) is a storage device which provides a user with a large amount of text, graphic, and/or sound information. For example, job training programs and manuals, encyclopedias, science programs, documentaries, plays, and collections of art works, photographs, and slides are today available on CD-ROM. An advantage of CD-ROM is rapid access to specific information. Also, CD-ROM can store a configuration of motion, sound, text, and still images.

Videodisc. Videodiscs, like CD-ROM, allow access to large amounts of information (textual, graphic, and sound), with the addition of full motion video. Videodisc technology, when connected to a computer with programming software, permits the user to control audio and video playback, to add computer generated text and graphics, and to design entire training and instructional sequences based upon student responses.

Video Production. The video cameras and videotape recording decks available today are lightweight, extremely mobile, and easy to use, facilitating the development of education and training materials at much reduced costs.

Of significance for this analysis is that these rapidly advancing technological capabilities are now being integrated and matched by a user friendliness that allows, indeed provokes, an independent, do-it-yourself attitude by learners in diverse settings and circumstances. The potential for bringing powerful learning resources directly to millions is developing rapidly. How this potential can impact the education and training system is addressed in the next section.

The Education and Training System

One of the principal beneficiaries of these emerging forces is the education and training system in the United States and, indeed, across the globe. The word system, however, may be an exaggeration. Historically, there has been very little that is systemic about the fragmented collection of education and training components that exists. Nevertheless, all levels and sectors are experiencing substantial pressure for restructuring and convergence.

The U.S. **public K-12 education system** includes nearly 16,000 school districts and 82,000 schools, with over 2.5 million teachers and administrators serving over 48 million students. Total expenditures exceed $250 billion, mostly for personnel. The K-12 private school system adds over 5 million students, 375,000 teachers and administrators, and expenditures of $20 billion.

At the K-12 level, student performance data continue to be debated, particularly with respect to comparisons with other countries. A consensus is emerging, however, that many graduates do not have the relatively high level of skills they need to learn and work successfully in the new century's society and workplace. Reports from the National Assessment of Educational Progress indicate that students perform reasonably well on low level skills and are doing as well or better on these skills than students in previous generations. The performance gap increases substantially when focused on the considerably higher levels of knowledge and skills needed in the society and workplace we wish to create.

There is increasing attention given to public educational reform. Our assessment, however, is that the scope and nature of this reform is clearly inadequate to the needs. Not only is the reform quite fragmented, it is not taking place with sufficient speed and intensity to meet job market demands.

Some analysis leads one to question whether the existing public school system, with its attending bureaucracy and regulations, is equal to the task of fundamental educational reform. Such skepticism has led to increasing advocacy for school choice and for the development of alternatives to the traditional system. The recently reported success of Education Alterna-

tives, Inc., a for-profit education business, in revitalizing education at the Harlem Community School in Baltimore points to possible new directions.

The **higher education** sector constitutes a sizable market, with about $90 billion public and $50 billion private spending. The community college system is the fastest growing sector in the higher education marketplace. It is likely that the trends we have identified will contribute to an acceleration of growth in that sector. Approximately 75 percent of the new jobs being created require more than a high school diploma and less than a traditional four-year college degree. Community colleges stress technical education and are less constrained by the regulations of the K-12 sector or the traditions of higher education. Thus, it is likely that in the traditional education arena, community colleges will be a primary market for the products of the emerging learning technology industry.

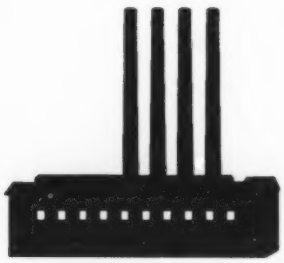
Workforce preparation continues to be a major concern at all levels, in both the private and public sectors. Rapid changes in demand for new products and services precipitate changes in the workplace and work itself, rendering obsolete the knowledge and skills of existing workers. Particularly acute deficiencies exist in workers' ability to learn new knowledge and skills rapidly.

Workplace education and training spending totaled $48 billion in 1992, with approximately 60 percent of that amount spent on white collar managerial staff. Restructuring and downsizing among companies of all sizes, however, has impacted primarily the white collar managers who received most of the training. With increasing attention being given to re-engineering work processes, we anticipate an explosion of expenditures on education and training for blue collar workers. The training is likely to focus on the same knowledge and skills being addressed by the secondary schools.

We anticipate an explosion of expenditures on education and training for blue collar workers.

Robert Reich, U. S. Secretary of Labor, speaking about the Goals 2000: Educate America Act, July 13, 1993, said:

> "There is a disconnect between the skills people have and the skills the economy requires. Part of the problem is determining how to move a workforce suited to one's economy quickly and smoothly into a world grown suddenly quite different . . . A skills standard system is an idea whose time has come and whose way has been paved in the thinking and organizing already underway both inside and outside of government. Putting together an effective system will provide the foundation for ongoing lifelong learning and enhance America's ability to productively match skills and jobs."



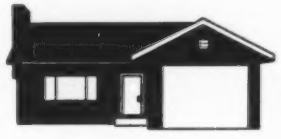
The Educational Testing Service reports that, unlike other industrial nations, a third of American workers receive no training for their jobs, let alone additional training to enhance their skills. ETS recommends increas-

ing the investment in training through such programs as investment tax credits, earmarking a payroll tax for training, and state initiatives. The ETS report is one of several influencing the current administration in its design of school-to-work transition, apprenticeship, and workplace training programs.

Despite the fact that the U.S. is already spending billions on training for existing workers, we believe that the demand for workplace education and training will grow substantially over the next several years, boosted in part by federal programs and by a continuing recognition by businesses that, in order to stay productive, efficient, and viable, they will need to provide enhanced and expanded training not only to their white collar workers, but to their line workers as well. We anticipate a three-fold increase in expenditures for education and training in the workplace by the year 2000, as companies simultaneously downsize the workforce and train those remaining for markedly higher levels of productivity and quality.

We anticipate a three-fold increase in expenditures for education and training in the workplace by the year 2000.

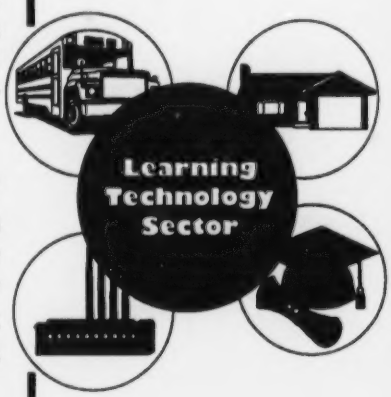
The **home** education market is by any yardstick a small segment, with less than 500,000 children taught at home. The number is growing rapidly, however, as state education laws are liberalized, parent dissatisfaction with public education increases, and home schooling resource materials improve. With 40 million homes equipped as home offices and 20 million workers using their homes as the primary workplace, the ingredients for significant growth are available. New learning technologies can fuel rapid growth in this area and provide sophisticated inhome learning opportunities on demand.



II. A New Paradigm: the Life-Long Learning Society

We are witnessing a revolution in the development of new learning resources, most of which will be available outside as well as inside schools. Louis Perelmen in his book, *School's Out*, suggests that the availability of information technologies poses a serious challenge to schools. We believe the configuration of forces we have outlined will create a new education and training paradigm in which learners, learning, and learning environments will be redefined and new investment opportunities spawned on an international scale.

Technology will provoke and support fundamental paradigmatic change. The new and emerging technologies will change what is taught, how it is taught, and how learning environments and opportunities are organized and provided, whether they be in schools, homes, libraries, workplaces, or storefronts.



It will be possible for learners to tap into a wide variety of "virtual schools" where learning is less constrained by time, place, and resources. Schools will become virtual as well as physical places in diverse settings where learners and workers of all ages can seek information and develop new skills and knowledge. Technology can provide "just-in-time" training at the job site, and integrate that training seamlessly with the work task at hand.

The new fusion of information technology and telecommunications will affect all organizations and institutions. This fusion is extremely dynamic and will change the fundamental structure of organizations, creating opportunities for alternatives to traditional schools and schooling and thus dramatically expand the market size in the learning technology industry.

Education and training services will depend on technology delivery systems because of the markedly higher knowledge and skills required for the future workforce. For example, the future worker will need to:

Manipulate Information

- Access and use information to perform effectively in new jobs which rely on electronically available data, voice, text, and graphics.

Communicate, Solve Problems, and Present Solutions

- Effectively employ technology and media for global communications, developing solutions as a team while separated geographically, and presenting concepts through multimedia unimpeded by language differences.

The provision of a comprehensive technology-based system for delivering education and training is critical to ensure that American students and adults possess the requisite skills and attitudes for participating in the future workplace.

Adjust to Change
- Develop the disposition to adjust to rapid job and career changes by using technology to stimulate future work scenarios.

Produce High Quality
- Meet world-class standards of production and quality through self-monitoring.

Work Cooperatively and Independently
- Develop the ability to work on a team; suggest innovative solutions independently by using technology for group problem solving, or as a self-paced, independent learner.

Be Entrepreneurial
- Develop entrepreneurial skills by using computer and video networks to introduce personal products and services in the marketplace.

Work Efficiently
- Learn efficiently by using technology productivity tools to enhance personal job performance.

The trend of empowering the customer and end user to do more of the work (the Automated Teller Machine syndrome) will put learners in control of their own learning. Learning will be driven less by Carnegie units and other traditional credentialing practices and more by demonstrable performance in the form of practice and product portfolios. Such demonstrations will facilitate bypassing the formal system of credentialing and certification, going directly to the employer with a validation of performance.

The provision of a comprehensive technology-based system for delivering education and training is critical to ensure that American students and adults possess the requisite skills and attitudes for participating in the future workplace. Access to educational services will need to be available throughout an American worker's entire career—beginning in school as a student and continuing throughout higher education and employment.

III. Features of the New Education and Training Marketplace

New and developing trends in society, the economy, and the workplace, the rapid development of a technology infrastructure, and the emergence of a lifelong learning society create a significant convergence of forces. Coupled with anticipated growth in a restructured education and training system, including not merely traditional K-12, higher education, and workplace training, but the home and other alternative settings, we are convinced there are substantial, perhaps unprecedented, opportunities for investment.

We see a cradle-to-grave learning system that provides a continuum of learning opportunities ranging from entertainment (what Neil Postman calls "edutainment") to structured information acquisition and knowledge and skills development. The education and training marketplace has several features which make it attractive for providers of services. These features include:

We are convinced there are substantial, perhaps unprecedented, opportunities for investment.

Accumulated Funding

- The new marketplace has a firm base of current funding that is being allocated more efficiently through cross-institutional partnerships in lieu of each sector providing its own training services—often redundant and not sensitive to lifelong learning needs.

Cross-Sector Training (accumulated markets)

- Previously separate sectors—education, employment, public services, the military — are working in new partnerships to build a lifelong learning capability to address their shared education and training needs.

Shared Needs

- The new marketplace shares similar needs and is willing to share resources across sectors.

"Just-in-Time" Training

- Training is seamlessly integrated with learning and work, and delivered at different times and in different locations through technology-based delivery systems.

Self-Paced Mastery/Learning

- Individually tailored, self-paced, and outcome-oriented training is possible through technology-based delivery systems.

The aggregation of current training resources and technology's capability for providing lifelong learning responsive to individual needs makes this

market attractive to providers of technology services, since they can provide real-time, online learning resources.

A consensus that education and training is an "engine of recovery" is shared not only by people in government and education, but also by businesses investing in education and training to improve quality. Companies are upgrading their blue collar workers and otherwise making them more productive through shared decision making processes such as team building and consensus management to improve quality and productivity. There is an increasing trend for companies to pay for knowledge and skills rather than for seniority.

On the school front the advocates of choice are making their voices heard. This will ultimately provide an impetus to allow parents to find ways to educate their children using a variety of educational approaches. Educators, particularly at the K-12 level and also at the postsecondary level, are concerned with equity of access to telecommunications resources. This will be a continuing concern throughout the nineties and will fuel the learning technology marketplace.

Home schooling is a small but rapidly growing market in the United States and is likely to expand in both urban and suburban areas as parents become increasingly dissatisfied with the schools.

Use of the home as an information/learning center is likely to accelerate dramatically. Home schooling is a small but rapidly growing market in the United States and is likely to expand in both urban and suburban areas as parents become increasingly dissatisfied with the schools either because they are not secure places for learning or because there is very little learning that can take place as schools lose resources and fail to make significant and fundamental changes in learning opportunities. Also, corporate education and training programs will deploy appropriate learning technologies to afford access to employees in their homes.

The emphasis on life-long learning is becoming a necessity, particularly as companies release workers through downsizing and restructuring. Unemployed white collar workers are likely to pursue additional learning more aggressively than blue collar workers, and inhome learning is a natural for this market sector.

One salient feature of the new lifelong learning marketplace is that America's major economic and social institutions—education, business, government, and defense—are crossing institutional barriers to form new partnerships focused on education and training. As a result, needs and resources related to training in these sectors are being accumulated and shared. By sharing resources and reaching consensus on the importance of lifelong learning, a once-fragmented market has coalesced and become focused. Examples of the new education and training paradigm include:

1. School and Business

Partnerships between the business community and schools have been forged to offer students and adults opportunities to use new technologies,

receive appropriate staff development, and engage in research and career development activities.

A recent article underscored industry's desire to seek new ways to support education by targeting their own in-house funds to support public education:

> At a time when Japan overshadows the world economy thanks to its technological advances, and a united and fully automated Germany looms as the leading economic powerhouse in Europe, many American students can barely locate these two countries on a map, much less compete with them in the world marketplace once they graduate.
>
> Because of this fear that the United States is losing its place as the innovator of democracy and capitalism in the world, educators are scrambling to find strategies that will turn American schools into institutions that turn out computer-literate graduates.
>
> The variable in education—as with any government service—is money, and now that the private sector realizes it can only benefit by well educated employees, and only lose by allowing schools to churn out graduates who cannot read, businesses are looking for ways to help fund education.

National, state, and regional partnerships between education and industry to develop technology-based education and training systems create new opportunities for combining public and private funds to ensure a well educated workforce. This represents a unique business opportunity for providers of educational and training services not only because of the accumulation of resources, but also because these sectors have reached consensus on the importance of training for revitalizing the economy.

2. Defense Conversion and Training for Employment

Funding for the defense sector is currently being redeployed to support national economic development, education, and public services. As a result, the defense sector is facing a massive retraining effort to ensure that military personnel may enter other employment sectors. The defense sector is entering into partnerships with education, business, industry, and governmental sectors in an effort to develop a national technology-based delivery system for job training and retraining.

3. Social and Public Services Support for Education

Social service agencies are entering into partnerships with education. This is being done to provide their clients with basic literacy and job entry skills for entering the workplace during the period in which social support services are being provided. New technology-based delivery systems for education and training are fundamental to these efforts. In short, the

social services sector perceives the provision of support services to clients as a short-term investment and support of education and training for self-sufficiency as a long-term investment.

These three examples of the new education and training paradigm demonstrate the scope and substance of the new market. They also represent factors that will dampen volatility and extend long-term performance of the learning technology sector.

IV. Infrastructure Capabilities for Entering the Marketplace

Five major developments in technology and policy arenas have emerged to collectively create a foundation, or infrastructure, for supporting the new marketplace.

1. Accumulated Funding
The existence of technology-based education and training systems and cross-institutional partnerships act as powerful motivators for encouraging sectors to aggregate funding to capitalize lifelong learning. Even the small percentage of dollars that the K-12 sector can devote to these new systems is considerable. New federal policies and funding for school-to-work transition support such aggregations, particularly when addressed to technology-based systems.

2. Technical Infrastructure
During the past half-decade a multitude of international, national, and state telecommunications networks have been implemented to provide education and training services to clients. This current delivery infrastructure can be used by providers to deliver services independent of location and time.

The existence of technology-based education and training systems and cross-institutional partnerships act as powerful motivators for encouraging sectors to aggregate funding to capitalize lifelong learning.

3. Media Convergence
New technologies are being developed for "bridging" or interconnecting existing networks. In effect, the technologies will aggregate the marketplace electronically by interconnecting millions of clients and locations on current networks. Video, computer, graphics, voice, and presentation technologies have been integrated into systems for addressing diverse education and training needs and aptitudes. Integrated learning systems are currently implemented in education and business sectors for providing comprehensive curriculum, instruction, and assessment.

4. Policies for Partnerships
New national and state policies encourage different sectors to forge partnerships for addressing shared education and training needs. The current school-to-work transition legislation signals a major trend in increased federal support for education and training.

5. Shared Vision
Providers can now create training products that can be shared across age groups, employment groups, and sectors because consensus has been reached on the importance of preparing students and adults for participating in the information-based economy.

V. Implications for Market Opportunities

The open system of cradle to grave education and training will provide a broad array of learning services directly to individual consumers as well as through traditional channels in the formal education system and the workplace. Opportunities for providing services to learners in a variety of settings will grow exponentially. We believe the most successful of these services will:

- provide universal access to a wide range of learning resources in the form of databases, online forums and interactive seminars, self-study instructional programs, and learner networks;

- provide a number of services that help learners "navigate" all of these resources and configure and implement learning programs for themselves. This will require a considerable amount of help from external sources.

An example of a product we believe addresses the notion of direct services to end users in multiple learning and work settings is the Global Network Navigator provided by O'Reilly and Associates, a small book publisher in California. The Navigator is a software program that is part interactive magazine, part book catalog, and part computer menu for retrieving information in the Internet. We anticipate that there will be scores of such ventures attempting to develop alternatives to paper-based publications. These alternatives will be applicable to any large information utility and communications network, be it Internet or its successors and competitors.

Companies combining the telephone and the cable controller in one box atop the television represent another means of providing user friendly access to information, entertainment, and education resources. While we are more optimistic about the market potential of education and training software and programming services than hardware and the technology highway itself, we anticipate that equipment which increases ease of access and use will find a ready and exploding market.

Though we see unprecedented growth in this new "learning technology" market sector, to be successful in developing and delivering new products and services for lifelong education and training, whether for formal learning and work or for "edu-" and "info-tainment", will likely require corporate players to overcome several problem areas:

- reluctance of the traditional education and training institutions to move away from the "time and place bound" market;

- changes in the regulatory environment regarding information services;

- providing some kind of a definition of what universal service means in terms of information and edutainment services into the home;
- the staggering pace of development in both hardware and software; and
- establishing compatibility among the various hardware and software systems that abound, particularly dealing with such services as distance learning, interactive video, and so forth.

We believe, however, that these problems will be dispatched quickly as the promise of the enormous market becomes clear.

VI. Grasping Opportunities: Critical Success Factors

Merely identifying new and emerging education and training markets will not be enough to realize prosperity. Successful investors will need to select specific products and services and business sectors and companies. In this section we outline what we consider to be the characteristics of successful products and services, and what types of companies are likely to be successful.

The learning technology marketplace will initially tend to be a very volatile environment. However, the centrality of education and training to all societal functions will find some stability not enjoyed by other emerging, high growth sectors. Who will dominate it and how is very difficult to determine. Certainly cable companies, with their control of the existing market, have the potential to dominate, but most are debt laden and may not be able to finance the substantial development costs for preparing new services. Telephone companies, regional and otherwise, on the other hand, have substantial resources for investment, but have not previously provided programming services. These circumstances have provoked the bidding wars for companies such as Paramount and MGM Studios and the recent acquisition of TCI by Bell Atlantic.

We are cautious regarding market projections in this area because there does not appear to be any common standard for how telecommunications and related information services will be provided. Several circumstances prompt caution in making investment decisions based on factors beyond those typically involved with stock purchase or company acquisition, such as quality of leadership, products, size of market, and so forth.

While segmentation will continue to be important in marketing, it is likely that there will be less differentiation in the transformation of information resources for both the general public and for specific target audiences of learners.

Characteristics of Successful Services

Based on our analysis, we believe that the most successful investments in the learning technology sector will focus not on the development and operation of the information highway system itself but on the information supermarket (i.e., packaging programs and services) to which the highway system will be connected. Support for this approach is provided in the recent acquisition efforts aimed at film studios and other large depositories of programming. This focus on software (selling razor blades rather than razors) will be particularly important if the federal government gets involved in supporting the development of the information highway. Such

The most successful investments in the learning technology sector will focus not on the development and operation of the information highway system itself but on the information supermarket (i.e., packaging programs and services) to which the highway system will be connected.

involvement is likely to complicate the development of the infrastructure, but leave programming to the private sector.

Developing learning programs and services for alternative markets to the formal system of education and training will be profitable, as will providing value-added products for the existing system.

We believe that developing learning programs and services for alternative markets to the formal system of education and training will be profitable, as will providing value-added products for the existing system. We see a continuing challenge in creating programming sufficiently attractive to both educate and entertain a very disparate audience. This will require that software/programming allow for considerable consumer choice in configuring services. The degree to which existing education and training products can be repurposed for new settings and circumstances will be critical to the speed and ease of market entry and penetration.

Another characteristic of successful services is that they will be easily and seamlessly integrated within the existing package of services without creating a need for substantial new learning by the user. Such transparency will be a demanding requirement, as the complexity and sophistication of the new services outstrips the relatively unsophisticated services available now. Universal road maps and navigational aids will be essential.

Characteristics of Successful Companies

We believe there are several characteristics of companies that will be successful, and these criteria can be used as a screen for selecting investment opportunities. Characteristics of companies that are likely to be successful are those that:

- form alliances and establish virtual companies, both public and private;
- identify unique niches within and across traditional education and training market sectors—particularly those where "just in time" service is critical;
- work across several levels of the system to flexibly address the rapid changes in technology and the uncertainties regarding what will sell in the marketplace;
- work outside of the schools as supplements or alternatives to the existing system;
- provide specific services that guarantee performance gains;
- provide ease of access to education and training products in several settings, including homes; and
- serve small companies that cannot afford training departments, but require state-of-the-art education and training in order to compete.

Companies that can thrive at the intersection of several market sectors and product categories and configure various services from this diverse array will likely have an advantage. These companies will be able to provide synergy through these configurations by working across a number of providers and products. Indeed, with the plethora of learning products and systems that are likely to become available over the next several years, one of the most useful services will be in helping clients select from that wide array and package something useful for themselves or their corporations.

We see the traditional market segments as being less and less important for investment decisions. The distinctions traditionally made between the home, school, and the workplace as marketplaces for educational and training services may no longer be a productive way of developing market segmentation plans. The range of services that will be available will allow for a much more finely grained market segmentation that may in many instances actually cut across the traditional groupings.

We provide on the following pages brief case descriptions that illustrate the pathways that successful company development may take.

The distinctions traditionally made between the home, school, and the workplace as marketplaces for educational and training services may no longer be a productive way of developing market segmentation plans.

Case A

In 1988 a U.S. firm was created to address the ongoing training requirements in a highly technical area where keeping up to date ("just in time") is a prerequisite for staying in business. The creation of this firm grew out of the early realization that many of the converging market pressures we cite here were taking shape some six years ago. For example:

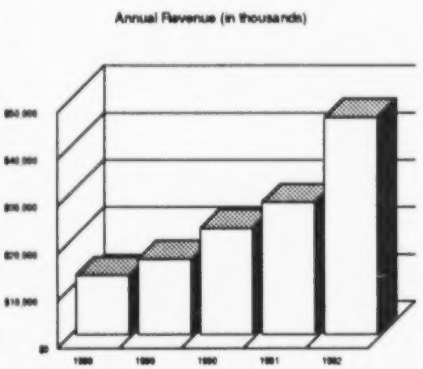
1. The traditional training providers were not keeping the technicians adequately up to date and product quality and revenues were suffering.

2. Although high quality training was available, the cost was prohibitive on a national scale.

3. Technology-assisted delivery systems were emerging that provided opportunities for frequent training programs at less cost than the traditional institutions were offering on an infrequent, less timely basis.

4. The technological delivery systems were becoming "instructor friendly," allowing the technical "content experts" to play an integral role in the shaping of the training products.

5. The potential resolution to these converging factors in one market sector could potentially create a training service delivery capacity for multiple market sectors.



Since 1988, this small firm has grown to serve a broad array of market sector training needs on a national/international scale. Shown below is the company's annual revenue growth curve. This firm entered what we call the new "learning marketplace" earlier than most. Their bottom-line performance is testimony to the validity of their decisions and a clear illustration of the acquisition and investment potential we observe in this new arena.

Case B

Another more contemporary example is that of a technology development firm struggling to survive in the cable supplier marketplace. Although their technology provides a capacity of interest to most cable operators, substantial subscriber interest has been slow to grow. Recently, education and training applications delivered to the home became the focus of developmental alliances and the struggling company finds itself as the target of major stock purchases by its developmental partners. It appears likely that acquisition is a probable near-term outcome. Other outcomes are a likely increase in national and international sales based on timely delivery of education and training made available in the home and workplace. The probability of these outcomes is directly related to the convergence of needs, market, and technology that we outline in this document.

Conclusions and Recommendations

Based on this analysis, we conclude:

- The education and training market for the life-long learning society will grow substantially over the next few years, spurred by social, economic, and workplace trends and by a political recognition of the importance of education and training as an engine of recovery.

- Emerging technologies will provide a means for reaching learners and workers of all ages in both traditional and non-traditional settings and circumstances.

- Successful products and services in this new electronic information supermarket will be those that help end users navigate the information highways, configure learning programs from among the burgeoning resources, and develop competencies that themselves can be "marketed" to schools, workplaces, homes, and other organizations.

- All of the foregoing conditions give rise to a new "learning technology" investment sector.

Based on these conclusions, we recommend that further, more focused, detailed research be devoted to such activities as these:

1. Identify specific products and services that will produce high return in the new learning technology marketplace. We believe this search should focus not only on wholly new products and services, but on new combinations and configurations of existing products with or without technology embedded.

2. Examine companies with potential in the areas that we have described, focusing on education in the workplace, home schooling, and supplementary services to education and training organizations in the traditional education market, particularly the community college. It is likely that there are some well positioned companies in these markets with reasonable products, but without technology applications. We would include these companies in our analysis as well, looking for opportunities where technology will enhance existing products and services.

The above research will yield insights into the new learning technology market sector to inform:

- investments in new companies with extremely high growth potential;

- investments in long-established companies whose revenues will be enhanced through the market access provided by new technologies;

- the likelihood of profitable joint ventures and mergers; and
- decisions regarding promising acquisition targets.

The above research will be undertaken:

(1) for specific investment institutions to address any of the above or other specific decision situations; and

(2) on an ongoing basis as the foundation on which a monthly **Learning Technology Market Newsletter** will be based.

Information regarding these services should be addressed to:

Gregory M. Benson, President
Learning Systems Engineering
Box 340, East Road
Stephentown, New York 12168
518.733.6324